UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER
LAROSE, COLIN M

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/835,392	LABELLE, LILIAN
	Examiner	Art Unit
	Colin M. LaRose	2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 August 2005</u>.
2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-18 and 20-31</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-3,5-7,9-12,14,15,17,18,20-25,27-29 and 31</u> is/are rejected.
7)☒ Claim(s) <u>4,8,13,16,26 and 30</u> is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>29 August 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All   b)☐ Some * c)☐ None of:
        1.☒ Certified copies of the priority documents have been received.
        2.☐ Certified copies of the priority documents have been received in Application No. _____.
        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 29 August 2005 has been entered.

Drawings

2.   The replacement drawings for figures 6a and 6b have been received and accepted.

Response to Amendments and Arguments

3.   Applicant's arguments with respect to newly-amended claim 1 have been fully considered

and are persuasive for the reasons proffered by the Applicant. Therefore, the previous rejection

has been withdrawn.

In view of newly discovered prior art, a new grounds of rejection appears below.

Claim Objections

4.   The following sections of 37 CFR §1.75(a) and (d)(1) are the basis of the following

objection:

> (a)   The specification must conclude with a claim particularly pointing out
> and distinctly claiming the subject matter which the applicant regards as his
> invention or discovery.

> (d)(1)   The claim or claims must conform to the invention as set forth in
> the remainder of the specification and the terms and phrases used in the
> claims must find clear support or antecedent basis in the description so
> that the meaning of the terms in the claims may be ascertainable by
> reference to the description.

5.   Claims 25, 26 are objected to under 37 CFR §1.75(a) and (d)(1) as failing to particularly

point out and distinctly claim the subject matter that the applicant regards as the invention.

Claim 25 improperly refers to the "image indexing method" of claim 12 when claim 12 is

an "image search method." Claim 26 depends from 25 and includes the same error.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

7.   Claims 21 and 23 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. Computer programs per se are non-statutory. In order

for a program claim to be permissible, it must contain instructions that are embodied in a

tangible medium for performing the claimed program steps. Examples of acceptable language

are:

"A computer program embodied in a computer readable medium for performing the steps

of ..."; or

"A computer readable medium storing a program for performing the steps of ..."

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

9.   Claims 1-3, 5, 6, 9-12, 14, 15, 17, 18, 20-25, 27, 28, and 31 are rejected under 35 U.S.C.

103(a) as being unpatentable over "Image Retrieval Using Flexible Image Subblocks" by Ko et

al. ("Ko") in view of "Similarity of Color Images" by Stricker et al. ("Stricker").

Regarding claim 1, Ko discloses a method of indexing a digital image comprising a

plurality of blocks (§ 3.1: image is divided into 9 subblocks), comprising the following steps:

generating a first information item characteristic of the visual content of the image (§

3.1.1: the first moment – characteristic of the average color – is computed for each block);

generating a second information item from the first information item, wherein the second

information item is indicative of a degree of significance of the visual content of at least one of

the plurality of blocks with respect to the overall content of the image and thereby characteristic

of the spatial distribution of the visual content of the image in its image plane (§ 3.1.1: the

second moment – characteristic of the color variance – is computed from the first moment for

each block; computing the second moment for each block provides indications of the relative

degree of significance of the visual content of each block with respect to the overall content –

that is, a high variance is indicative of a block having a large variety of color, and a block having

a low variance is indicative of a block having relatively few colors; also, since the variance is

calculated for localized image subblocks, it provides information pertaining to the spatial

distribution of colors contained in the image); and

associating, with the image, an index composed of the first information item and the

second information item (§ 3.1.1: the index is comprised of the first and second moments).

Ko does not expressly disclose that "the second moment is generated from the first

moment," however, Stricker shows that those skilled in the art were aware of such a fact.

Stricker, which is cited by Ko in § 2.3, teaches in § 4 on p. 387, that the first moment (average)

is utilized to generate the second moment (variance). Based on this teaching, those skilled in the

art would have known that Ko's second information item is generated from the first information

item, as claimed.

Regarding claim 2, Ko discloses the step of generating the first information item

comprises:

dividing the image plane of the image according to a portioning comprising the plurality

of blocks, the plurality of blocks comprising a predefined number N of blocks (§ 3.1: 9 blocks);

extracting, from each of the blocks, a data item of a first type representing at least one

characteristic of the visual content of the block under consideration (i.e. Ko extracts the average

color value of each block); and

generating the first information item as being a vector having N components, each of

which is one of the data items of the first type (i.e. Ko's first information is a vector with nine

average color entries, corresponding to each block).

Regarding claim 3, Ko discloses the step of generating the second information item comprises:

extracting, from each of the blocks, a data item of a second type indicative of a degree of significance of the visual content of the block under consideration with respect to the overall content of the image (i.e. Ko extracts the color variance of each block, the variance indicative of the relative significance of each block); and

generating the second information item as being a vector having N components, each of which is one of the data items of the second type (i.e. Ko's second information is a vector with nine color variance entries, corresponding to each block).

Regarding claim 5, Ko discloses dividing the image plane into a rectangular grid of nine blocks (see § 3.1).

Regarding claim 6, Ko discloses 9 (3x3) blocks rather than 16 (e.g. 4x4) blocks. Examiner takes official notice of the fact that utilizing 16 blocks rather than 9 is an obvious expedient and would have been an obvious modification to those skilled in the art at the time of the invention. In addition, no unexpected results or the like are achieved by using 16 blocks rather than 9, so Ko's 9 blocks appear to be functionally equivalent to the claimed 16 blocks in that both methods achieve substantially the same results.

Regarding claim 9, Ko discloses each of the data items of the first type is the average color in the block – the average color representing the average distribution of colors within each block.

Regarding claims 17 and 20-22, Ko discloses a computer readable medium and digital

device for performing the method of claim 10 (i.e. Ko's method is computer-implemented).

Regarding claim 10, Ko discloses a method of searching for images, as claimed, in

accordance with the indexing method of claim 1 (see entire disclosure).

Regarding claim 11, Ko discloses calculating a first similarity, as claimed (§ 4.2: eq. 4),

providing a first subset of images, as claimed (§ 4.2: "primary candidate images" of a "first

stage"), calculating a second similarity, as claimed (§ 4.2: eq. 7), and providing at least one result

image, as claimed (§ 4.2: "k closest images" of a "second stage").

Regarding claim 12, Ko discloses the first similarity calculates a distance between the 2nd

information item of the example image and the 2nd information item of the stored image, as

claimed (see § 4.2, equation 4: difference in variance between stored and example images).

Regarding claim 25, Ko discloses the step of generating the second information item

comprises:

calculating, from each of the blocks, a data item of a second type indicative of a degree of

significance of the visual content of the block under consideration with respect to the overall

content of the image (i.e. Ko extracts the color variance of each block, the variance indicative of

the relative significance of each block); and

generating the second information item as being a vector having N components, each of

which is one of the data items of the second type (i.e. Ko's second information item is a vector

with nine color variance entries, corresponding to each block).

Regarding claim 27, Ko discloses dividing the image plane into a rectangular grid of nine

blocks (see § 3.1).

Regarding claim 28, Ko discloses 9 (3x3) blocks rather than 16 (e.g. 4x4) blocks.

Examiner takes official notice of the fact that utilizing 16 blocks rather than 9 is an obvious

expedient and would have been an obvious modification to those skilled in the art at the time of

the invention. In addition, no unexpected results or the like are achieved by using 16 blocks

rather than 9, so Ko's 9 blocks appear to be functionally equivalent to the claimed 16 blocks in

that both methods achieve substantially the same results.

Regarding claim 14, Ko discloses the second similarity calculates a distance between the

1st information item of the example image and the 1st information item of the stored image, as

claimed (see § 4.2, equation 4: difference in average color between stored and example images).

Regarding claim 15, Ko discloses the second similarity is implemented by calculating a

sum of the distances between each of the components of the 1st information item of the example

image and the 1st information item of the stored image, as claimed (see § 4.2, equation 4: sum of

differences in average color between stored and example images).

Regarding claims 18, 23, 24, and 31, Ko discloses a computer readable medium and

digital device for performing the method of claim 10 (i.e. Ko's method is computer-

implemented).

10.   Claims 7 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ko in

view of Stricker, as applied to claims 2 and 13, and further in view of "Extracting Multi-

Dimensional Signal Features for Content-Based Visual Query" by Chang et al. ("Chang").

Regarding claims 7 and 29, Ko does not disclose dividing the image according to a quadtree decomposition, as claimed.

Chang discloses indexing an image and searching for a like image on the basis of the index. In particular, Chang discloses extracting color features from the image to be indexed and then compiling the color features into an index – see § 2.2. In addition, Chang also discloses that it is advantageous to decompose the image into a quad-tree representation in order to form shapes of coherent color. In "Quad-Tree Based Color Histogram Indexing" on pp. 7-8, Chang discloses that is it preferable to index color features on the basis of a quad-tree representation of the image that has been utilized to segment the image according to color.

It would have been obvious to one skilled in the art to modify Ko and Stricker by Chang to achieve the claimed invention by dividing the image according to a quad-tree decomposition, as claimed, and then calculating and storing the second information item according to the quad-tree structure, as claimed, since Ko discloses dividing an image into blocks for the purposes of color indexing, and Chang further teaches that it is advantageous to not only divide the image into blocks for the purposes of color indexing, but also decompose the image according to a quad-tree representation that identifies spatially similar color blocks so as to index each of the quad-tree blocks with a color feature. As Chang teaches, in order to prevent spatial information from being "lost completely," the quad-tree decomposition of the image to be indexed is utilized (see p. 7); the quad-tree representation exhibits advantages over Ko's subblock division such as identification of regions of coherent color to better represent salient objects within the image.

Allowable Subject Matter

11.   Claims 4, 8, 13, 16, 26, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

These claims are allowable because the combination of Ko with the other cited prior art does not fairly disclose or suggest the limitations contained therein in combination with all of the limitations of the claim(s) from which the claims in question depend.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. **Please note that this case has been reassigned to Colin LaRose.** If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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CML
Group Art Unit 2627
12 December 2005

VIKKRAM BALI
PRIMARY EXAMINER